Seiji ISHII*: On three varieties of *Pinus pentaphylla* and their interrelationship

石井盛次*: ヒメコマツの3型とそれらの相互関係

It has been well-established that the soft pines in the Islands of Japan have four types, viz. Pumila-type (*Pinus pumila* Regel), Parviflora-type (*Pinus parviflora* S. et Z.), Koraiensis-type (*Pinus koraiensis* S. et Z.), Armandi-type (*Pinus armandi* Franch. var. *amamiana* Hatsusima). The type in question here is Parviflora-type. The name Parviflora-type was given by Siebold and Zuccarini¹⁾ in 1842. As Miyabe and Kudo²⁾ pointed out, this name is to be a cover term for three kinds, viz. the southern form of Parviflora-type, the northern form of Parviflora-type, and Pumila-type.

Many present-day scholars in Japan further divide Parviflora-type into two kinds, namely the northern form *Pinus pentaphylla* Mayr var. *pentaphylla* and the southern form var. *himekomatsu* Koidzumi, respectively. Recently, Miki³⁾ described semi-fossils found in the Islands of Japan which are associated with Pleiocene and Pleistocene, and stated that some of these semi-fossile should be associated with pines of Parviflora-type. This fossillized form closely resembles the living southern form above mentioned, but its cone and seed are approximately one and a half times larger than those of the living form. However. its seed wing is shorter than the seed. (On the other hand, the seed wing of the northern form is longer than the seed, and its cone is correspondingly long.)

The semi-fossils of Parviflora-type, discovered by Miki, have been collected from such prefectures as Yamaguchi, Hyogo, Osaka, Kyoto, Shiga, Ishikawa, Toyama, Niigata (Sado Island), and Kanagawa. The living Parviflora-type found in Utsulyoto (or Dagelet) Island in Korea is to be identified with nothing but these semi-fossils. There is every reason to believe that this form of Parviflora-type was widely distributed in the Island of Japan towards the end of the Tertiary period.

It is well-known that, as is revealed in Nakai's research, Utsulyoto Island is rich in such endemic species as *Fagus multinervis* Nakai, *Tilia insularis* Nakai, *Acer okamotoanum* Nakai, and also rich in *Tsuga sieboldii* Carr., *Reynoutria sachalinensis* Nakai, *Sasa kurilensis* Makino, that is, those species are found in

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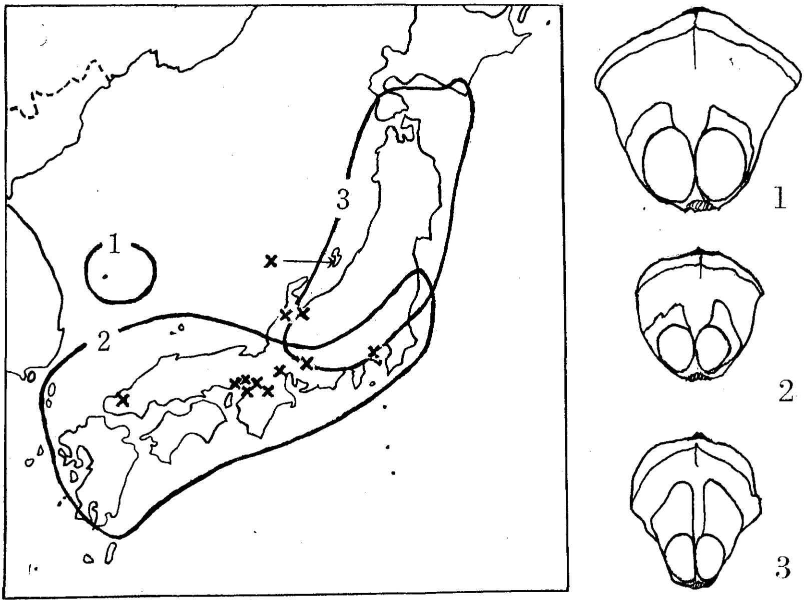

Fig. 1. Distribution map and sketches of cone scales and seeds. 1. *Pinus pentaphylla* var. *macrocarpa*. 2. var. *himekomatsu*. 3. var. *pentaphylla*. ×in the map shows a locality of Miki's remains.

the Islands of Japan, but never in Korea nor in the Continent of Asia. The cone and seed of Parviflora-type found in Utsulyoto Island are very large and this form is exactly of the same type as the semi-fossils discovered by Miki.

Thus, there are two kinds in the Islands of Japan and their neighborhood, that is, var. *pentaphylla* as the northern form, and var. *himekomatsu* as the southern form. Further, in Utsulyoto Island a new variety var. *macrocarpa* Ishii is found. Therefore, there are three forms of this type in all. Though it is difficult to clarify the interrelationship of these three forms, I can safely infer, from the size of cone and seed, development of seed wing, and shapes revealed in semi-fossils associated with the recent geological age by Miki, that the form of Utsulyoto Island (Macrocarpa-form) is the oldest one, and that both the southern form (Himekomatsu-form) which is now generally found in such southern localities of Japan as Shikoku, Kyushu, and Kii Peninsula, and the northern form (Pentaphylla-form) which is now widely distributed in northern Japan, have developed through isolation or mutation.

Pinus pentaphylla Mayr, Monogr. Abiet. Jap. 78, 94, t. 6 (1890).

Syn. *Pinus parviflora* Sied. et Zucc., Fl. Jap. **2**: 27, t. 165 (1842) pro parte.

var. **macrocarpa** Ishii, var. nov.

Arbor magna erecta 10 m alta, interdum 30 m alta, 60–70 cm lata in ambitu, ramis arboris vetae coronam angustatam formantibus. Cortices arbororum vetarum cinereo-brunnei quadrangulariter laminati, arbororum novellarum tenues laeves viridi-brunnei. Virgae novellae viridi- vel badii-brunneae, crinibus brevibus infra bases fascium foliorum. Gemmae hiemales ovoideae plus minus cylindricae, squamis rubribrunneis fimbriatis reflexis. Folia quinata persistentia 2–3 annis. Folia ramularum coniferarum 3.5–6.0 cm longa, 1.0–1.2 mm lata, margine tenuiter serrulate, lineis stomaticis albis quadrifariis supra superficies ventrales duas, canalibus resiniferis duobus externis. Strobili subsessiles solitarii vel racemosi erecti ovoidei 10.5 cm longi, 5.5 cm lati, squamis ovoideis coriaceis late cuneatis 3 cm longis, 2.8–3.0 cm latis, aciebus externis rotundatis integris leviter reflexis. Semina alata, alis brevioribus nuculis, nuculis 15 mm longis, 7 mm latis, alis latis adnatis 10 mm longis.

Hab. Utsulyoto (or Dagelet) Island, Korea. Endemic.

Typus. Zyoho (上峯), Dagelet Island (T. Nakai no. 4732, Jun. 2, 1917) in TI.

Literature cited

1) Siebold et Zuccarini (1842), Fl. Jap. **2**: 27, 28, t. 115. 2) Miyabe et Kudo (1921), Icon. essent. forest trees Hokkaido. **1**: 29. 3) Miki, S. (1957), Pinaceae of Japan, with special reference to its remains. Journ. Inst. Polytechnics, Osaka City Univ. Ser. D, **8**: 246, 248, 249.

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ヒメコマツ (*Pinus pentaphylla*) に北方型 (var. *pentaphylla* キタゴヨウ), 南方型 (var. *himekomatsu* ゴヨウマツ) ともう一つの型 (var. *macrocarpa* 新変種オオミノゴヨウ) の3型がある。オオミノゴヨウは朝鮮うつ陵島の特産である。これらの三つの型の相互の関係を, 球果と種子の大いさ, 種子翼の発達程度, それに三木茂博士の発見になる最近の地質時代の半化石に見出される形態などから推定して, うつ陵島のものが最も古型であって, 他の二つの型はこの原型からその後になって出現した新しいものであると考察した。